

Mathematics Assessment Anchors and Eligible Content



Grade

4



Pennsylvania Department of Education

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The Assessment Anchors, as defined by the Eligible Content, are organized into cohesive blueprints, each structured with a common labeling system that can be read like an outline. This framework is organized first by Reporting Category, then by Assessment Anchor, followed by Anchor Descriptor, and then finally, at the greatest level of detail, by an Eligible Content statement. The common format of this outline is followed across the PSSA.

Here is a description of each level in the labeling system for the PSSA:

Reporting Category

The Assessment Anchors are organized into four classifications, as listed below.

- A = Numbers and Operations
- B = Algebraic Concepts
- C = Geometry
- D = Data Analysis and Probability

These four classifications are used throughout the grade levels. In addition to these classifications, there are five Reporting Categories for each grade level. The first letter of each Reporting Category represents the classification; the second letter represents the Domain as stated in the Common Core State Standards for Mathematics. Listed below are the Reporting Categories for Grade 4.

- A-T = Number and Operations in Base Ten
- A-F = Number and Operations – Fractions
- B-O = Operations and Algebraic Thinking
- C-G = Geometry
- D-M = Measurement and Data

The title of each Reporting Category is consistent with the title of the corresponding Domain in the Common Core State Standards for Mathematics. The Reporting Category title appears at the top of each page.

Assessment Anchor

The Assessment Anchor appears in the shaded bar across the top of each Assessment Anchor table. The Assessment Anchors represent categories of subject matter (skills and concepts) that anchor the content of the PSSA. Each Assessment Anchor is part of a Reporting Category and has one or more Anchor Descriptors unified under and aligned to it.

Anchor Descriptor

Below each Assessment Anchor is one or more specific Anchor Descriptors. The Anchor Descriptor adds a level of specificity to the content covered by the Assessment Anchor. Each Anchor Descriptor is part of an Assessment Anchor and has one or more Eligible Content unified under and aligned to it.

Eligible Content

The column to the right of the Anchor Descriptor contains the Eligible Content statements. The Eligible Content is the most specific description of the skills and concepts assessed on the PSSA. This level is considered the assessment limit and helps educators identify the range of the content covered on the PSSA.

Reference

In the space below each Assessment Anchor table is a code representing one or more Common Core State Standards for Mathematics that correlate to the Eligible Content statements.

M04.A-T Number and Operations in Base Ten

Reporting Category

ASSESSMENT ANCHOR

M04.A-T.1 Generalize place value understanding for multi-digit whole numbers.

DESCRIPTOR

ELIGIBLE CONTENT

M04.A-T.1.1 Apply place-value and numeration concepts to compare, find equivalencies, and round.

M04.A-T.1.1.1 Demonstrate an understanding that in a multi-digit whole number (through 1,000,000), a digit in one place represents ten times what it represents in the place to its right.

Example: Recognize that in the number 770, the 7 in the hundreds place is ten times the 7 in the tens place.

M04.A-T.1.1.2 Read and write whole numbers in expanded, standard and word form through 1,000,000.

M04.A-T.1.1.3 Compare two multi-digit numbers through 1,000,000 based on meanings of the digits in each place, using $>$, $=$, and $<$ symbols.

M04.A-T.1.1.4 Round multi-digit whole numbers (through 1,000,000) to any place.

Reference:

4.NBT.1, 4.NBT.2, 4.NBT.3

M04.A-T Number and Operations in Base Ten

Reporting Category

ASSESSMENT ANCHOR

M04.A-T.2 Use place value understanding and properties of operations to perform multi-digit arithmetic.

DESCRIPTOR

M04.A-T.2.1 Use operations to solve problems.

ELIGIBLE CONTENT

M04.A-T.2.1.1 Add and subtract multi-digit whole numbers (limit sums and subtrahends up to and including 1,000,000).

M04.A-T.2.1.2 Multiply a whole number of up to four digits by a one-digit whole number and multiply 2 two-digit numbers.

M04.A-T.2.1.3 Divide up to four-digit dividends by one-digit divisors with answers written as whole-number quotients and remainders.

M04.A-T.2.1.4 Estimate the answer to addition, subtraction, and multiplication problems using whole numbers through six digits (for multiplication, no more than 2 digits \times 1 digit, excluding powers of 10).

Reference:

4.NBT.4, 4.NBT.5, 4.NBT.6

M04.A-F Number and Operations – Fractions

Reporting Category

ASSESSMENT ANCHOR

M04.A-F.1 **Extend understanding of fraction equivalence and ordering.**

DESCRIPTOR

ELIGIBLE CONTENT

M04.A-F.1.1 Find equivalencies and compare fractions.

M04.A-F.1.1.1 Recognize and generate equivalent fractions.

M04.A-F.1.1.2 Compare two fractions with different numerators and different denominators (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100) using the symbols $>$, $=$, or $<$, and justify the conclusions.

Reference:

4.NF.1, 4.NF.2

M04.A-F Number and Operations – Fractions

Reporting Category

ASSESSMENT ANCHOR

M04.A-F.2 Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

DESCRIPTOR

ELIGIBLE CONTENT

M04.A-F.2.1 Find equivalencies and compare fractions.

- M04.A-F.2.1.1** Add and subtract fractions with a common denominator (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100; answers do not need to be reduced; no improper fractions as the final answer).
- M04.A-F.2.1.2** Decompose a fraction or a mixed number into a sum of fractions with the same denominator (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100), recording the decomposition by an equation. Justify decompositions (for example, by using a visual fraction model).
Example 1: $\frac{3}{8} = \frac{1}{8} + \frac{1}{8} + \frac{1}{8}$ OR $\frac{3}{8} = \frac{1}{8} + \frac{2}{8}$
Example 2: $2\frac{1}{12} = 1 + 1 + \frac{1}{12} = \frac{12}{12} + \frac{12}{12} + \frac{1}{12}$
- M04.A-F.2.1.3** Add and subtract mixed numbers with a common denominator (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100; no regrouping with subtraction; fractions do not need to be reduced; no improper fractions as the final answers).
- M04.A-F.2.1.4** Solve word problems involving addition and subtraction of fractions referring to the same whole or set and having like denominators (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100).
- M04.A-F.2.1.5** Multiply a whole number by a unit fraction (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100; final answers do not need to be reduced or written as a mixed number).
Example: $5 \times (\frac{1}{4}) = \frac{5}{4}$
- M04.A-F.2.1.6** Multiply a whole number by a non-unit fraction (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100; final answers do not need to be reduced or written as a mixed number).
Example: $3 \times (\frac{5}{6}) = \frac{15}{6}$
- M04.A-F.2.1.7** Solve word problems involving multiplication of a whole number by a fraction (denominators limited to 2, 3, 4, 5, 6, 8, 10, 12, and 100).

Reference:

4.NF.3, 4.NF.4

M04.A-F Number and Operations – Fractions

Reporting Category

ASSESSMENT ANCHOR

M04.A-F.3 Understand decimal notation for fractions, and compare decimal fractions.

DESCRIPTOR

M04.A-F.3.1 Use operations to solve problems involving decimals, including converting between fractions and decimals (may include word problems).

ELIGIBLE CONTENT

M04.A-F.3.1.1 Add two fractions with respective denominators 10 and 100.
Example: Express $\frac{3}{10}$ as $\frac{30}{100}$, and add $\frac{3}{10} + \frac{4}{100} = \frac{30}{100} + \frac{4}{100} = \frac{34}{100}$.

M04.A-F.3.1.2 Use decimal notation for fractions with denominators 10 or 100.
Example: Rewrite 0.62 as $\frac{62}{100}$ and vice versa.

M04.A-F.3.1.3 Compare two decimals to hundredths using the symbols $>$, $=$, or $<$, and justify the conclusions.

Reference:

4.NF.5, 4.NF.6, 4.NF.7

M04.B-O Operations and Algebraic Thinking

Reporting Category

ASSESSMENT ANCHOR

M04.B-O.1 Use the four operations with whole numbers to solve problems.

DESCRIPTOR

M04.B-O.1.1 Use numbers and symbols to model the concepts of expressions and equations.

ELIGIBLE CONTENT

- M04.B-O.1.1.1** Interpret a multiplication equation as a comparison. Represent verbal statements of multiplicative comparisons as multiplication equations.
Example 1: Interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5.
Example 2: Know that the statement 24 is 3 times as many as 8 can be represented by the equation $24 = 3 \times 8$ or $24 = 8 \times 3$.
- M04.B-O.1.1.2** Multiply or divide to solve word problems involving multiplicative comparison, distinguishing multiplicative comparison from additive comparison.
Example: Know that 3×4 can be used to represent that Student A has 4 objects and Student B has 3 times as many objects, and not just 3 more objects.
- M04.B-O.1.1.3** Solve multi-step word problems posed with whole numbers using the four operations. Answers will be either whole numbers or have remainders that must be interpreted yielding a final answer that is a whole number. Represent these problems using equations with a symbol or letter standing for the unknown quantity.
- M04.B-O.1.1.4** Identify the missing symbol (+, −, ×, ÷, =, <, >) that makes a number sentence true (single-digit divisor only).

Reference:

4.OA.1, 4.OA.2, 4.OA.3

M04.B-O Operations and Algebraic Thinking

Reporting Category

ASSESSMENT ANCHOR

M04.B-O.2 Gain familiarity with factors and multiples.

DESCRIPTOR

M04.B-O.2.1 Develop and apply number theory concepts to represent numbers in various ways.

ELIGIBLE CONTENT

M04.B-O.2.1.1 Find all factor pairs for a whole number in the interval 1 through 100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the interval 1 through 100 is a multiple of a given one-digit number. Determine whether a given whole number in the interval 1 through 100 is prime or composite.

Reference:

4.OA.4

M04.B-O Operations and Algebraic Thinking

Reporting Category

ASSESSMENT ANCHOR

M04.B-O.3 **Generate and analyze patterns.**

DESCRIPTOR

M04.B-O.3.1 Recognize, describe, extend, create, and replicate a variety of patterns.

ELIGIBLE CONTENT

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| M04.B-O.3.1.1 | Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself.
<i>Example 1: Given the rule “Add 3” and the starting number 1, generate terms in the resulting sequence and observe that the terms alternate between odd and even numbers.</i>
<i>Example 2: Given the rule “increase the number of sides by 1” and starting with a triangle, observe that the tops of the shapes alternate between a side and a vertex.</i> |
| M04.B-O.3.1.2 | Determine the missing elements in a function table (limit to +, −, or × and to whole numbers or money). |
| M04.B-O.3.1.3 | Determine the rule for a function given a table (limit to +, −, or × and to whole numbers). |

Reference:

4.OA.5

M04.C-G Geometry

Reporting Category

ASSESSMENT ANCHOR

M04.C-G.1 Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

DESCRIPTOR

ELIGIBLE CONTENT

M04.C-G.1.1 List properties, classify, draw, and identify geometric figures in two dimensions.

M04.C-G.1.1.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

M04.C-G.1.1.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

M04.C-G.1.1.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into mirroring parts. Identify line-symmetric figures and draw lines of symmetry (up to two lines of symmetry).

Reference:

4.G.1, 4.G.2, 4.G.3

M04.D-M Measurement and Data

Reporting Category

ASSESSMENT ANCHOR

M04.D-M.1 Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

DESCRIPTOR

ELIGIBLE CONTENT

M04.D-M.1.1 Solve problems involving length, weight (mass), liquid volume, time, area, and perimeter.

M04.D-M.1.1.1 Know relative sizes of measurement units within one system of units including standard units (in., ft, yd, mi; oz., lb; c, pt, qt, gal), metric units (cm, m, km; g, kg; mL, L), and time (sec, min, hr, day, wk, mo, yr). Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. **A table of equivalencies will be provided.**

Example 1: Know that 1 kg is 1,000 times as heavy as 1 g.

Example 2: Express the length of a 4-foot snake as 48 in.

M04.D-M.1.1.2 Use the four operations to solve word problems involving distances, intervals of time (such as elapsed time), liquid volumes, masses of objects; money, including problems involving simple fractions or decimals; and problems that require expressing measurements given in a larger unit in terms of a smaller unit.

M04.D-M.1.1.3 Apply the area and perimeter formulas for rectangles in real-world and mathematical problems (may include finding a missing side length). Whole numbers only. **The formulas will be provided.**

M04.D-M.1.1.4 Identify time (analog or digital) as the amount of minutes before or after the hour.
Example 1: 2:50 is the same as 10 minutes before 3:00.
Example 2: Quarter past six is the same as 6:15.

Reference:

4.MD.1, 4.MD.2, 4.MD.3

M04.D-M Measurement and Data

Reporting Category

ASSESSMENT ANCHOR

M04.D-M.2 Represent and interpret data.

DESCRIPTOR

M04.D-M.2.1 Organize, display, and answer questions based on data.

ELIGIBLE CONTENT

M04.D-M.2.1.1 Make a line plot to display a data set of measurements in fractions of a unit (e.g., intervals of $\frac{1}{2}$, $\frac{1}{4}$, or $\frac{1}{8}$).

M04.D-M.2.1.2 Solve problems involving addition and subtraction of fractions by using information presented in line plots (line plots must be labeled with common denominators, such as $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$).

M04.D-M.2.1.3 Translate information from one type of display to another (table, chart, bar graph, or pictograph).

Reference:

4.MD.4

M04.D-M Measurement and Data

Reporting Category

ASSESSMENT ANCHOR

M04.D-M.3 **Geometric measurement: understand concepts of angle; measure and create angles.**

DESCRIPTOR

ELIGIBLE CONTENT

M04.D-M.3.1 Use appropriate tools and units to sketch an angle and determine angle measurements.

M04.D-M.3.1.1 Measure angles in whole-number degrees using a protractor. With the aid of a protractor, sketch angles of specified measure.

M04.D-M.3.1.2 Solve addition and subtraction problems to find unknown angles on a diagram in real-world and mathematical problems. (Angles must be adjacent and non-overlapping.)

Reference:

4.MD.6, 4.MD.7